Space Weather Forecast

Issued on Sunday, 19 June 2022 at 01:12 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Daily chance of an isolated moderate-class X-ray flare.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was low through the UTC day of Saturday 18 June, with occasional small common class X-ray flares. These flares were generally well-spread between many of the front-side sunspots, of which there were up to twelve. The largest flare of the period was a middling common-class observed from one of the larger and historically more productive regions at 18/2105UTC in the southwestern quarter of the sun, this despite this group having shown a reduction in area and shrinking trailing spots in the period.

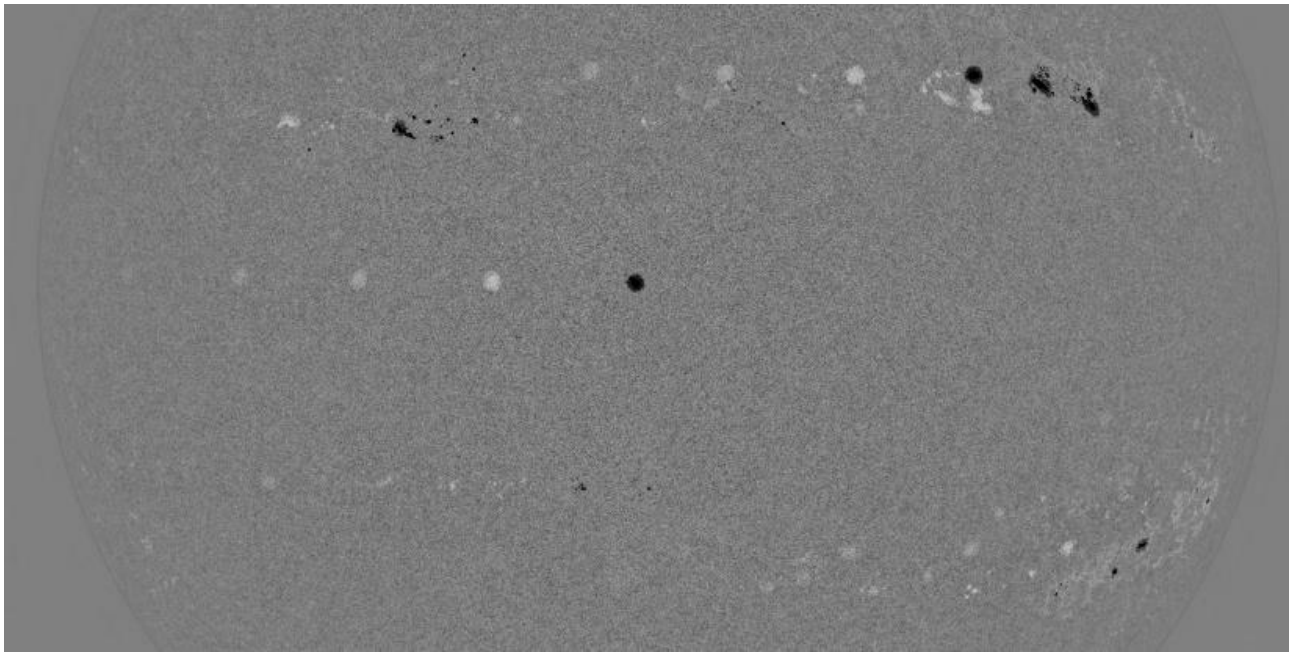

Figure 1: 5 days' worth of westward progress and development of numerous sunspots on the facing side of the sun (current in black; past positions in white). The most active region of the period can be seen lower right, with all other regions thus far unremarkable in terms of X-ray flares. Image processing courtesy of Helioviewer.org.

Most of the current roster of sunspots are small and magnetically simple: either unipolar or simple magnetic dipoles. Of the remainder, the two most noteworthy were in the northern solar hemisphere, although neither produced particularly marked flare activity.

A large 'filament' (arc of plasma) in the northwest showed some movement into the early evening UTC, as did a smaller feature in the northeast at the end of the 24 hours, however neither

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appeared to result in any Coronal Mass Ejection (CME) on available imagery, and there are thought to be none en route at present.

Solar Wind / Geomagnetic Activity: The solar wind was relatively static in the past 24 hours and is presumed to remain characteristic of a continuing fast wind.

The solar wind speed showed a very slight decline in the 24 hours into elevated speeds, while the number of particles comprising the wind was near-flat just above the long-term background. The magnetic field associated with these particles was within normal background levels.

The net result of the above solar wind measures was a provisional G1 Minor Geomagnetic Storm for the final three hours of the 24, else being lower in magnitude and somewhat variable.

Energetic Particles / Solar Radiation: No solar radiation storms were observed in the period, and levels relaxed fully to background in the period, having been very slightly enhanced since the 13 June moderate-class X-ray flare.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be low, with a daily chance of an isolated moderate-class flare.

Solar Wind / Geomagnetic Activity: No CMEs feature in the forecast, and the only fast wind is that being experienced at present. Geomagnetic activity should therefore peak on day one, Sunday 19 June, with a slight chance of isolated Minor Storm G1 intervals, else gradually decreasing to mainly quiet into the new working week, with a slow solar wind regime probable from Tuesday (day three).

Energetic Particles / Solar Radiation: Solar radiation storms are not likely in the period and should remain at background levels. There is a daily slight chance of an S1 or greater event occurring, with this mainly due to the presence of two of the larger and nominally more complex regions nearing the western solar horizon.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

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Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	25	25	20
Very Active	R3 to R5 X	No	5	5	5	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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